D. Glossary

aliasing: A stairstep effect on a raster display of a line or arc segment.

antialiasing: A method for reducing the severity of aliasing effects seen in lines and edges drawn on a bit-mapped display device. This method adjusts the intensity of a pixel used to represent a portion of a line or edge according to the pixel's distance from the line or edge. Antialiasing reauires that the display device be capable of producing one or more intermediate intensity levels between bright and off.

asynchronous communications: A method of transmitting data in which the timing of character placement of connecting transmitting lines is not critical. The transmitted characters are preceded by a start and followed by a stop bit, thus permitting the interval between characters to vary.

aspect ratio: The ratio of width to height. For the rectangular picture transmitted by a television station, the aspect ratio is 4:3.

back porch: The portion of a horizontal blanking pulse that follows the trailing edge of the horizontal synchronizing pulse.

background illumination: The average brightness of a screen.

bandwidth: The number of bits per second that can be transferred by a device.

binary array: Alternate name for a two-dimensional bit map in which each pixel is represented as single bit.

BitBlt: Bit aligned block transfer. Transfer of a rectangular array of pixel information from one location in a bitmap to another with potential of applying 1 of 16 boolean operators during the transfer.

bit map: 1. The digital representation of an image in which bits are mapped to pixels. 2. A block of memory used to hold raster images in a device-specific format.

bit plane: Hardware used as a storage medium for a bit map.

black level: The amplitude of the composite signal at which the beam of the picture tube is extinguished (becomes black) to blank retrace of the beam. This level is established at 75% of the signal amplitude.

blanking signal: Pulses used to extinguish the scanning beam during horizontal and vertical retrace periods.

breakpoint: A place in a routine specified by an instruction, instruction digit, or other condition, where the routine may be interrupted by external intervention or by a monitor routine.

clipping: Removing parts of display elements that lie outside a given boundary, usually a window or a viewport.

composite video: The color-picture signal plus all blanking and synchronizing signals. The signal includes luminance and chrominance signals, verti-

cal- and horizontal-sync pulses, vertical- and horizontal-sync pulses, vertical-and horizontal-blanking pulses, and the color-burst signal.

DAC: Digital-to-analog converter. A device that converts a digital input code to an analog output voltage or current. The analog output level represents the value of the digital input code.

direct access: Pertaining to the process of obtaining data from, or placing data into, storage where the time required for such access is independent of the location of the data most recently obtained or placed in storage.

display area: The rectangular part of the physical display screen in which information coded in conformance with a video encoding standard is visibly displayed. The display area does not include the border area.

display element: A basic graphic element that can be used to construct a display image.

display memory: The area of memory which is used to hold the graphics image output to the video monitor.

display pitch: The difference in memory addresses between two pixels that appear in vertically adjacent positions (one directly above the other) on the screen.

display unit: A device which provides a visual representation of data.

dot clock: The dot clock cycles the rate at which video data is output to a CRT monitor.

DRAM refresh: The operation of maintaing data stored in dynamic RAMs. Data are stored in dynamic RAms as electrical charges across a grid of capacitive cells. The charge stored in a cell will leak off over time.

execution unit: The portion of a central processing unit that actually executes the data operations specified by program instructions.

field: 1. A group of contiguous bits in a register or memory dedicated to a particular function or representing a single entity. 2. A software-configurable data type in the TMS34010 whose length can be programmed to be any value in the range 1 to 32 bits.

fill: Solid coloring or shading of a display surface, often achieved as a pattern of horizontal segments.

frame: 1. The time required to refresh an entire screen. 2. The screen image output during a single vertical sweep.

frame buffer: A portion of memory used to buffer rasterized data to be output to a CRT display monitor. The contents of the frame buffer are often referred to as the bit map of the display and contain the logical pixels corresponding to the points on the monitor screen.

front porch: The portion of a horizontal blanking pulse that precedes the leading edge of the horizontal sync pulse.

GKS: Graphical Kernel System. An application programmer's standard interface to a graphics display.

glue logic: The small- and medium-scale-integrated devices necessary to complete the interface between two or more large or very-large-scale integrated devices.

gray scale: A scale of light intensities from black to white.

GSP: Graphics System Processor. A single-chip device embodying all the processing power and control capabilities necessary to manage a high-performance bit-mapped graphics system. The TMS34010 is the first such device.

high-impedance: The third state of a three-state output driver, in which the output is driven neither high or low but behaves as an open connection.

hold signal: A signal from a device capable of controlling a processor bus (for example, a processor or a DMA controller) which the device sends to a bus arbiter to request control of the bus. Typically, the arbiter signals the granting of the request by sending a hold-acknowledgement signal to the requesting device.

hold time: The minimum amount of time that valid data must be present at an input after the device is clocked to ensure proper data acceptance.

horizontal blanking interval: The time during which the display is blanked to cover the horizontal retracing of the electron beam.

horizontal sync: The synchronization signal that enables horizontal retrace of the electron beam of a CRT display.

icon: A graphic symbol representing a menu item.

interlaced scanning: A system of TV-picture scanning. Odd-numbered scanning lines, which make up an odd field, are interlaced with the even-numbered lines of an even field. The two interlaced fields constitute one frame. In effect, the number of transmitted pictures is doubled, thus reducing flicker.

interlaced scanning: A system of TV-picture scanning. Odd-numbered scanning lines, which make up an odd field, are interlaced with the even-numbered lines of an even field. The two interlaced fields constitute one frame. In effect, the number of transmitted pictures is doubled, thus reducing flicker.

lookup table: A table used during scan conversion of the digital image that converts color-map addresses into the actual color values displayed.

LRU: Least-recently-used cache-replacement algorithm. When a cache miss occurs, a cache-replacement algorithm selects which cache segment will be overwritten, based on the likelihood that the data in the discarded segment will not be needed again for some time. The LRU algorithm selects the segment which was used least recently.

mask: A pattern of characters that is used to control the retention or elimination of portions of another pattern of characters.

memory map: A map of memory space partitioned into functional blocks.

monotonicity: The quality of proceeding in a uniform manner. For example, the analog level output from a DAC should increase with each increase in the value of the digital input code.

multiplexing: Refers to a process of transmitting more than one set of signals at a time over a single wire or communications link.

NABTS: North American Broadcast Teletext Specification

NAPLPS: Abbreviation for the North American Presentation Level Protocol Syntax, which is a proposed standard for Videotex services.

nonmaskable interrupt: An interrupt request that cannot be disabled.

NMI: Nonmaskable interrupt. The NMI is an interrupt that is permanently enabled; it cannot be disabled.

NTSC: Abbreviation for the National Television System Committee, a group representing a wide range of interests in the television broadcast and video industry. The NTSC is instrumental in developing standards.

operand: That which is operated upon. An operand is usually identified by an address part of an instruction.

origin: The zero intersection of X and Y axes from which all points are calculated.

overlay: The plane of a graphics display that can be superimposed on another plane.

pack: To compress data in a storage medium by eliminating redundant information in such a way that the original data can later be recovered.

palette: A digital lookup table used in a computer graphics display for translating data from the bit map into the pixel values to be shown on the display.

pan: Apparent horizontal or vertical movement of a computer graphics screen (or window) over an image contained in a frame buffer that is too large to be completely displayed in a single static picture.

phase: The time interval for each clock period in a system is divided into two phases. One phase corresponds to the time the clock signal is high, and the other phase corresponds to the time the clock signal is low.

PHIGS: The programmer's Hierarchical Interactive Graphics Standard

pipelining: A design technique for reducing the effective propagation delay per operation by partitioning the operation into a series of stages, each of which performs a portion of the operation. A series of data is typically clocked through the pipeline in sequential fashion, advancing one stage per clock period.

pitch: The difference in starting addresses of two adjacent rows of pixels in a two-dimensional pixel array.

pixel: Picture element. 1. The smallest controllable point of light on a CRT display screen. 2. In a bit-mapped display, the logical data structure that

contains the attributes to be shown at the corresponding physical pixel position on the CRT display screen.

pixel processing operation: A specified Boolean or arithemetic operation used to combine two pixel values (source and destination).

PixBlt: (Abbreviation of Pixel Block transfer) Operations on arrays of pixels in which each pixel is represented by one or more bits. PixBlt operations are a superset of BitBlt operations, and include not only the commonly-used boolean functions, but also integer arithmetic and other multi-bit operations.

plane: (Also bit plane or color plane.) A plane is a bit-map layer in a display device with multiple bits per pixel. If the pixel size is *n* bits, and the bits in each pixel are numbered 0 to *n*-1, plane 0 is made up of bits numbered 0 from all the pixels, and the plane *n*-1 is made up of bits numbered *n*-1 from all the pixels. A layered graphics display allows planes or groups of planes to be manipulated independently of the other planes.

primary colors: A set of three colors from which all other colors may be regarded as derived; hence, any of a set of visual stimuli from which all colors may be produced by mixture. Each primary color must be different from the others, and a combination of two primaries must be capable of producing a third. In color television, the three primary colors are red, green and blue.

propagation delay: The time required for a change in logic level at an input to a circuit to be translated into a resulting change at an output.

protocol: A set of rules, formats, and procedures governing the exchange of information between peer processes at the same level.

pulse width: Pulse width, T_W. The time interval between specified reference points on the leading and trailing edges of the pulse waveform.

Random Access Memory (RAM): A memory from which all information can be obtained at the output with approximately the same time delay by choosing an address randomly and without first searching through a vast amount of irrelevant data.

raster: A rectangular grid of picture elements whose intensity levels are manipulated to represent images. In a bit-mapped display, the bits within a portion of the memory referred to as the frame buffer are mapped to the raster pattern of a CRT monitor.

raster display: A CRT display generated by an electron beam that illuminates the CRT by sweeping the beam horizontally across the phosphor surface in a predetermined pattern, providing substantially uniform coverage of the display area.

raster graphics: Computer graphics in which a display image is composed of an array of pixels arranged in rows and columns.

Raster-Op: The arithmetic or logical combination operation that takes place during the transfer of pixel arrays from one location to another.

raster scan: The grid pattern traced by the electron beam on the face of the CRT in a television or similar raster-scan display device.

ready signal: A signal from a memory or a memory-mapped peripheral that informs the processor when it is ready to complete a memory cycle. Slower memories or memory-mapped peripherals must extend the length of the memory cycle by negating the ready signal (in other words, by sending the processor a "not ready" signal until such time as the cycle can be completed.

resolution: The number of visible distinguishable units in the device coordinate space.

refresh: Method which restores charge on capacitance which deteriorates because of leakage.

reset: To restore to normal action.

resolution: The number of visible distinguishable units in the device coordinate space.

retrace: The line traced by the scanning beam or beams of a picture tube as it travels from the end of one horizontal line or field to the beginning of the next line or field.

RGB monitor: Red-Green-Blue Monitor. An RGB monitor is a CRT monitor capable of displaying colors and having separate inputs for the three signals used to drive the red, green and blue guns of the CRT.

relative coordinates: Location of a point relative to another data point.

rotate: To transform a display or display item by revolving it around a specified axis or center point.

scale: A size change made by multiplying or dividing the coordinate dimensions by a constant value.

scale factor: The value by which you divide or multiply the display dimensions in a scaling operation.

scaling: Enlarging or reducing all or part of a display image by multiplying the coordinates of display elements by a constant value.

scan line: A horizontal line traced across a CRT by the electron beam in a television or similar raster-scan device.

screen refresh: The operation of dumping the contents of the frame buffer to a CRT monitor in synchronization with the movemnt of the electron beam.

scrolling: Moving text strings or graphics vertically or horizontally.

segment: A collection of display elements that can be manipulated as a unit.

sequencing: Control method used to cause a set of steps to occur in a particular order.

setup time: The minimum amount of time that valid data must be present at an input before the device is clocked to ensure proper data acceptance.

shift register transfer: A transfer between the RAM storage and internal shift register in a video RAM.

sprite: A graphic object of a specified pattern appearing on its plane in a position determined by a single coordinate pair, specifying the sprite's location on the screen in the horizontal and vertical axis.

stairstepping: A visual effect seen in bit-mapped display devices which produce images by brightening or dimming individual picture elements (or pixels) contained in a two-dimensional grid of such elements. Stairstepping (also called aliasing) is the rough or jagged appearance of lines and edges which are not perfectly horizontal or vertical, resulting from transitions of the line or edge from one row or column of elements to another.

superimposed: Refers to the process that moves data from one location to another, superimposing bits or characters on the contents of specified locations.

tap point: The column address provided to a VRAM during a memory-to-shift-register cycle. The column address specifies the point at which the shift reigster is to be "tapped;" in other words, which cell of the shift register is to be connected to the serial output of the VRAM.

trace: A line of the graphics display.

transformation: Geometric alteration of a graphics display, such as scaling, translation, or rotation.

transparency: When a pixel with the attribute of transparency is written to the screen, it is effectively invisible, and does not alter that portion of the screen it is written to. For example, in a pixel array containing the pattern for the letter *A*, all pixels surrounding the *A* pattern could be given a special value indicating that they are transparent. When the array is written to the screen, the *A* pattern, but not the pixels in the rectangle containing it, would be invisible.

VDI: Virtual Device Interface. The standard interface between the device-independent and the device-dependent levels of a graphics system.

VDM: Virtual Device Metafile. A standard mechanism for retaining and and transporting graphics data and control information at the level of the Virtual Device Interface.

vertical blanking interval: The time during which the display is blanked to cover the vertical retracing of the electron beam.

vertical blanking pulse: A positive or negative pulse developed during vertical retrace and appearing at the end of each field. It is used to blank out scanning lines during the vertical retrace interval.

vertical sync: The synchronization signal that enables vertical retrace of the electron beam of a CRT display.

video display processor: A microprocessor device dedicated to the tasks of display memory management (storage, retrieval, and refresh) and generation of all required video, control, and synchronization signals required by a TV display or CRT monitor.

video overlay: The mixing of one video signal with another such that parts of the image carried by the first signal replace the corresponding parts of the image carried by the second signal.

video RAM, VRAM: Video Random-Access Memory. A dual-ported memory device for computer graphics applications, containing two interfaces; one interface to allow a processor to read or write data from an internal memory array; a second interface to provide a serial stream of screen refresh data to a CRT display device.

viewport: The specified window on the display surface that marks the limits of a display.

virtual coordinate system: A coordinate system created by mapping a portion of the world coordinate system to the space available on your device.

virtual space: Space referenced with the coordinates defined by the application.

wait state: A clock period inserted into a memory cycle in order to permit accesses of slower memories and slower memory-mapped peripherals.

window: A specified rectangular area of a virtual space shown on the display.

window clipping: Allowing text and graphics drawing to occur only within a specified rectangular window on the screen.

wire frame: A three-dimensional image displayed as a series of line segments outlining its surface.

zoom: To scale a display or display item so it is mangified or reduced on the screen.